

Mars Rover Celebration NGSS Alignment

WEEK 3: DESIGNING THE MISSION
LESSON 6: MISSION MEASUREMENTS
GRADE LEVEL: 6-8

PERFORMANCE EXPECTATIONS

In the NGSS framework, one of the important things that teachers need to do is explicitly identify when Science and Engineering Practices (SEP) and Cross Cutting Concepts (CCC) are being covered. The SEP's and CCC's are pervasive throughout the Mars Rover Celebration curriculum. The tables here are intended to assist the teacher in deciding when to mention that an SEP or CCC is part of the material being presented.

Lesson Objectives		
Students who demonstrate understanding can: <ul style="list-style-type: none">• Refine their team's scientific question so that it can be answered by data and/or modeling• Brainstorm possible missions for the scientific question chosen• Determine reasonableness of proposed missions• Use the brainstorming process to enhance meaningful learning• Use the proposed mission matrix worksheet to help determine the most practical mission		
MS Engineering Design		
MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of a problem.		
SCIENCE AND ENGINEERING PRACTICES (SEP)	DISCIPLINE CORE IDEAS (DCI)	CROSSCUTTING CONCEPTS (CCC)
Planning and Carrying Out Investigations Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions	ESS1: Earth's Place in the Universe: ESS1.B: Earth and the Solar System	System and System Models Models can be used to represent systems and their interactions
Constructing Explanations and Designing Solutions Construct a scientific explanation based on valid and reliable evidence obtained from sources and the assumption that theories and laws	ETS1: Engineering Design: ETS1.A: Defining and Delimiting Engineering Problems	

that describe the natural world
operate today as they did in the past
and will continue to do so in the
future

SUMMARY OF THE THREE DIMENSIONS

The 5E lesson model provides the 5 phases of learning that helps to facilitate the process of science understanding. Teachers are encouraged to use the table below to help align their teaching methods with the embedded Science and Engineering Practices (SEP), Disciplinary Core Ideas (DCI) and Cross Cutting Concepts (CCC) present in the lesson.

5E MODEL PHASE	SCIENCE AND ENGINEERING PRACTICES (SEP)	DISCIPLINE CORE IDEAS (DCI)	CROSSCUTTING CONCEPTS (CCC)
ENGAGE	Planning and Carrying Out Investigations	Earth and the Solar System	Systems and System Models
EXPLORE	Planning and Carrying Out Investigations	Earth and the Solar System Defining and Delimiting Engineering Problems	Systems and System Models
EXPLAIN	Constructing Explanations and Designing Solutions	Earth and the Solar System Defining and Delimiting Engineering Problems	Systems and System Models
ELABORATE	Constructing Explanations and Designing Solutions	Earth and the Solar System	Systems and System Models
EVALUATE	Performance Expectations	Performance Expectations	Performance Expectations